polynucleotide complementary to the nucleic acid of said microorganism which confers resistance to said antibiotic.

38 ~~134.~~ (~~Twice Amended~~) The method of claim [146] ~~150~~, wherein said sample is suspected of containing a [target] nucleic acid associated with a genetic disorder and wherein said compound comprises a polynucleotide complementary to the nucleic acid associated with said genetic disorder.

39 ~~135.~~ (~~Twice Amended~~) The method of claim [146] ~~150~~ wherein said sample is suspected of containing a [target] nucleic acid associated with or absent in thalassemia and wherein said compound comprises a polynucleotide complementary to the nucleic acid which is associated with or absent in thalassemic subjects.

40 ~~136.~~ (~~Twice Amended~~) The method of claim [146] ~~150~~ for chromosomal karyotyping which comprises contacting said sample with a series of said compounds which are complementary to a series of known genetic nucleic acids located on chromosomes.

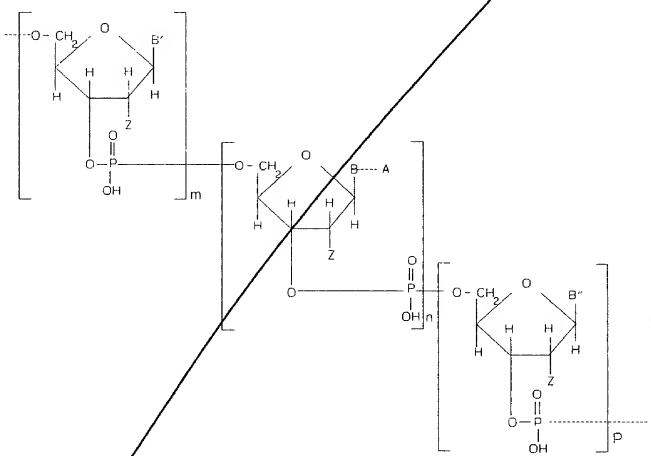
141. (Twice Amended) The method of claim [147] 151 wherein said cells are malignant cells [which comprises detecting malignant cells by detecting abnormal hormonal receptor sites associated therewith].

41 ~~142.~~ (~~Twice Amended~~) The method of claim [146] ~~150~~ wherein said sample is suspected of containing a nucleic acid which codes for expression of a polypeptide [diagnostic for] associated with a tumor cell and wherein said compound comprises a polynucleotide complementary to the messenger ribonucleic acid transcribed from a deoxyribonucleic acid associated with the production of said polypeptide.

Please add the following new claims:

150. (New) A method of detecting the presence or absence of a nucleic acid in a sample which comprises the steps of

(a) contacting said sample with at least one compound comprising the structure:



wherein each of B, B', B" represents a purine, 7-deazapurine, or pyrimidine moiety covalently bonded to the C1'-position of the sugar moiety, provided that whenever B, B' or B" is purine or 7-deazapurine, the sugar moiety is attached at the N^9-position of the purine or 7-deazapurine, and whenever B, B' or B" is pyrimidine the sugar moiety is attached at the N^1-position of the pyrimidine;

wherein A comprises at least three carbon atoms and represents at least one component of a signalling moiety capable of producing a detectable signal;

wherein B and A are attached directly or indirectly through a linkage group, said linkage group not interfering substantially with the characteristic ability of said compound to hybridize with said nucleic acid or of A to be detected;

wherein if B is purine, A is attached to the 8-position thereof, if B is 7-deazapurine, A is attached to the 7-position thereof, and if B is pyrimidine, A is attached to the 5-position thereof;

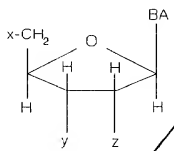
wherein m, n and p are integers, provided that m and p are not simultaneously 0 and provided further n is never 0; and

wherein z represents H- or HO-; and

(b) detecting said compound or compounds.

151. (New) A method for determining the presence or absence of cells having hormone receptor sites on the surfaces thereof in a sample, which method comprises the steps of:

(a) contacting said sample with a compound having the structure:



wherein B represents a purine, 7-deazapurine, or pyrimidine moiety covalently bonded to the C$^{1'}$-position of the sugar moiety, provided that when B is purine or 7-deazapurine, it is attached at the N^{9}-position of the purine or 7-deazapurine, and when B is pyrimidine, it is attached at the N^{1}-position;

wherein A comprises at least three carbon atoms and represents at least one component of a signalling moiety;

wherein B and A are attached together directly or indirectly through a linkage group;

wherein if B is purine, A is attached to the 8-position of the purine, if B is 7-deazapurine, A is attached to the 7-position of the 7-deazapurine, and if B is pyrimidine, A is attached to the 5-position of the pyrimidine, and wherein either z is H- or HO- and x and y together form the moiety

or x is HO- and y and z together form the moiety

; and

(b) detecting said compound so as to identify said hormone receptor sites.

152. (New) The method of claim 150 wherein the moiety A is a ligand.

153. (New) The method of claim 152 wherein the ligand is selected from the group consisting of a hapten, an antigen, a cofactor, biotin and iminobiotin.

154. (New) The method of claim 152 wherein the ligand is selected from the group consisting of dinitrophenol, lipoic acid and an olefinic compound.

155. (New) The method of claim 154 wherein the olefinic compound is allylamine.

156. (New) The method of claim 152 wherein the ligand is capable of forming a complex by binding with a detectable polypeptide.

157. (New) The method of claim 156 wherein the detectable polypeptide is selected from the group consisting of an antibody, an enzyme, streptavidin and avidin. capable of depositing insoluble reaction products

158. (New) The method of claim 157 wherein the antibody is a monoclonal antibody.

159. (New) The method of claim 156 wherein the sample is contacted with the detectable polypeptide after hybridization of the compound or compounds to said nucleic acid under suitable conditions as to form the complex.

160. (New) The method of claim 156 wherein an indicator molecule is associated with or bound to the detectable polypeptide.

9 ~~161~~. (~~New~~) The method of claim 8 ~~160~~ wherein the indicator molecule is fluorescent, electron dense, or an enzyme capable of depositing insoluble reaction products ~~reacting with a substrate to form a detectable product~~.

10 ~~162~~. (~~New~~) The method of claim 9 ~~161~~ wherein the enzyme is selected from the group consisting of alkaline phosphatase, peroxidase and 6-galactosidase.

11 ~~163~~. (~~New~~) The method of claim 9 ~~161~~ wherein the fluorescent indicator molecule is selected from the group consisting of fluorescein and rhodamine.

12 ~~164~~. (~~New~~) The method of claim 9 ~~161~~ wherein the electron dense indicator molecule is selected from the group consisting of ferritin, hemocyanin and colloidal gold.

13 ~~165~~. (~~New~~) The method of claim 8 ~~160~~ wherein the indicator molecule is covalently linked to the detectable polypeptide.

14 ~~166~~. (~~New~~) The method of claim 8 ~~160~~ wherein the detectable polypeptide is indirectly detectable by specifically complexing the detectable polypeptide with a second polypeptide covalently linked to an indicator molecule.

15 ~~167~~. (~~New~~) The method of claim 14 ~~166~~ wherein said detectable polypeptide is selected from the group consisting of avidin and streptavidin and the second polypeptide is selected from the group consisting of biotin and iminobiotin.

16 ~~168~~. (~~New~~) The method of claim 5 ~~158~~ wherein at least one of said compounds ~~compound~~ is labeled with a first indicator molecule and at least one other of said compounds ~~compound~~ is labeled with a second indicator molecule.

17 ~~169~~. (~~New~~) The method of claim 16 ~~168~~ wherein the compound labeled with the first indicator molecule is allowed to hybridize to the nucleic acid and is detected and then the

compound labeled with the second indicator molecule is allowed to hybridize to the nucleic acid and is detected.

~~170~~ 18. (~~New~~) The method of claim ~~150~~ 1 wherein the moiety A comprises an indicator molecule.

~~171~~ 19. (~~New~~) The method of claim ~~170~~ 18 wherein said indicator molecule is fluorescent, electron dense, or is an enzyme capable of ~~reacting with a substrate to form a detectable reaction product~~ depositing insoluble reaction products.

~~172~~ 20. (~~New~~) The method of claim ~~171~~ 19 wherein the enzyme is selected from the group consisting of alkaline phosphatase, peroxidase and 6-galactosidase.

~~173~~ 21. (~~New~~) The method of claim ~~171~~ 19 wherein the fluorescent indicator molecule is selected from the group consisting of fluorescein and rhodamine.

~~174~~ 22. (~~New~~) The method of claim ~~171~~ 19 wherein the electron dense compound is selected from the group consisting of ferritin, hemocyanin and colloidal gold.

~~175~~ 23. (~~New~~) A method of claim ~~150~~ 1 wherein said signalling moiety is capable of producing a detectable signal when the compound is incorporated into a double-stranded ribonucleic acid, deoxyribonucleic acid duplex or DNA-RNA hybrid.

~~176~~ 24. (~~New~~) The method of claim ~~150~~ 1 wherein said detecting step (b) is carried out when the compound is hybridized to the nucleic acid.

~~177~~ 25. (~~New~~) The method of claim ~~150~~ 1 wherein said nucleic acid is immobilized on a solid support.

~~178~~ 26. (~~New~~) The method of claim ~~150~~ 1 wherein the moiety A comprises at least 5 carbon atoms.

~~179~~ 27. (~~New~~) The method of claim ~~150~~ 1 wherein the moiety A is non-aromatic.

180. (New) The method of claim 150 wherein B is selected from the group consisting of uracil, cytosine, deazaadenine, deazaguanine.

181. (New) The method of claim 150 wherein the linkage group comprises an olefinic bond at the α-position relative to B.

182. (New) The method of claim 181 wherein the linkage group comprises the moiety $-CH=CH-CH_2-NH-$.

183. (New) The method of claim 181 wherein the linkage group comprises the moiety

$$-CH=CH-CH_2-O-CH_2-\underset{\displaystyle OH}{\underset{|}{CH}}-CH_2-NH-.$$

184. (New) The method of claim 130 wherein said microorganism is Staphylococcus aureus, Candida albicans, Pseudomonas aeruginosa, Streptococcus pyrogenes, Neisseria gonorrhoeae or Mycobacterium tuberculosis and said antibiotic is selected from the group consisting of a penicillin, a tetracycline and an aminoglycoside.